DOCUMENT RESUME

ED 295 836 SE 049 218

TITLE	The Continuing Crisis in Science Education: The AAAS Responds. A Report to the Board of Directors.
INSTITUTION	American Association for the Advancement of Science, Washington, D.C.
REPORT NO	AAAS-Pub-86-12
PUB DATE	86
NOTE	38p.; Colored pages may not reproduce well.
AVAILABLE FROM	American Association for the Advancement of Science, Office of Science and Technology Education, 1333 H Street, NW, Washington, DC 20005 (free while supply lasts).
PUB TYPE	Viewpoints (120) -- Reports - Descriptive (141)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Bulletins; *Educational Change; *Educational Improvement; Educational Quality; *Elementary School Science; Elementary Secondary Education; Organization; Organizations (Groups); *Professional Associations; Program Descriptions; Program Design; Program Development; *Program Guides; Science Education; *Secondary School Science
IDENTIFIERS	*American Association for Advancement of Science

ABSTRACT

According to this report, since the 1960s many of the gains of post-Sputnik reform have been allowed to slip away and, as reports of the early 1980s have emphasized, elementary and secondary education has been neglected. The shock of technological and economic losses to other countries has once again alerted the United States to its educational shortcomings. The response of the American Association for the Advancement of Science (AAAS) to this renewed national awareness and sense of crisis is described in this report. The AAAS has established six new programs in its Office of Science and Technology Education. The first part of this document, "OSTE Programs," describes these programs including: (1) "Project 2061: Education for a Changing Future"; (2) "National Forum for School Science"; (3) "Coalition for Education in the Sciences"; (4) "Science Resources for Schools"; (5) "Challenge of the Unknown"; and (6) "Science Seminars for Teachers." The second part discusses other AAAS initiatives including the Office of Opportunities in Science, the Office of Communications, the Office of Public Sector Programs, and the Meetings and Publications Center. The last part of this booklet describes the structure and personnel of the AAAS. (CW)

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The AAAS Responds

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The Continuing Crisis in Science Education

The AAAS Responds

A Report to the Board of Directors
of the
American Association for the Advancement of Science

Washington, D.C.

1986

AAAS Publication 86-12

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The American Association for the Advancement of Science
1333 H Street, N.W., Washington, D.C. 20005

CONTENTS

Preface 1

Introduction 3

OSTE Programs 7
- Project 2061: Education for a Changing Future 9
- National Forum for School Science 11
- Coalition for Education in the Sciences 13
- Science Resources for Schools 15
- Challenge of the Unknown 17
- Science Seminars for Teachers 19
- OSTE Staff 21

Other AAAS Initiatives 23
- Office of Opportunities in Science 25
- Office of Communications 27
- Office of Public Sector Programs 28
- Meetings and Publications Center 29

About AAAS 31
- The American Association for the Advancement of Science 33
- The AAAS Board of Directors 34
- AAAS Sections 35
- AAAS Section Q Officers 37

PREFACE

I am often asked what it is that the American Association for the Advancement of Science (AAAS) is doing in education. So, I trust, are board members, section officers, staff members, and other AAAS leaders. This report is intended to provide all of us with a summary of current activities from which to fashion our answers.

We have gone through an eventful five years at AAAS as we have worked together to design and initiate a thoughtful, imaginative, and effective response to the crisis in science education. I believe that the main pieces of a cogent program of education are now in place and making headway. Our task in the years immediately ahead is to see to it that each component develops its full potential and persists long enough to have, in concert with the others, a major, lasting impact on the quality of science and mathematics education in the United States.

The report before you is misleading in that it concentrates solely on projects. Because projects have specified objectives, resources, and products, it is easier to describe them than the many nonproject activities that in truth command a large part of the staff's time and attention. Yet the fact is that these other day-to-day activities, while amorphous and variable, together constitute a significant part of the AAAS thrust in science education.

In all fairness, therefore, let me note some of the activities carried out by the AAAS education staff members apart from their work on the projects described in this report. They serve on various national education committees, commissions, boards, and task groups; take part in science education projects of many other organizations; collaborate with AAAS sections and affiliates; participate in professional affairs by attending meetings and conferences, writing papers for publication,

serving as peer-reviewers for scholarly journals and funding agencies, and giving papers at professional meetings; and on occasion they are called upon to provide information on and analyses of issues in science education to federal agencies, committees of Congress, and the news media.

And they keep me busy trying to stay up with them, for which I am grateful, if not always delighted.

F. James Rutherford
Chief Education Officer, AAAS

INTRODUCTION

In the early 1980s the United States was once again discovering that it was in trouble in education, and especially so in science and mathematics. The response of the American Association for the Advancement of Science to this renewed national awareness and sense of crisis is described in this report.

The surprise orbiting of Sputnik in 1957 alerted the United States to a new technological threat from the Soviet Union, and it quickly focused national attention on the need for the schools and colleges of the nation to produce more and better scientists and engineers. The AAAS response at that time was vigorous and thoughtful. It included the development of a widely used curriculum for elementary schools, the promulgation of standards, and the formation of a cooperative committee to coordinate the science education activities of scientific associations.

But before the decade of the 1960s was over, the nation had turned its attention from education to other matters, and the effort slackened. Many of the gains of the post-Sputnik reform were allowed to slip away, and in general, as the reports of the 1980s have emphasized so dramatically, elementary and secondary education in the nation was neglected and declined alarmingly.

It took the shock of our technological and economic losses to Japan and Europe to force the United States once again to confront its educational shortcomings. But the crisis of the 1980s is different from its predecessor in one vital respect: it brings with it a fuller recognition than before that no matter how many skilled scientists, mathematicians, and technicians we produce, we cannot remain a leader among nations if we do not prepare all of our citizens to participate fully and effectively in a world that is increasingly scientific and technological.

The AAAS committed itself to accept this new educational challenge. By 1982 it had determined what its resources were and formulated the plan of action described in the report, *Education in the Sciences: A Developing Crisis*. The broad purpose of the AAAS effort, as stated in that report, is as follows:

> We want to increase opportunities, in school and out, for all young people. We want them to develop a lasting interest in science, to see it as an important way of thinking, as an activity that is intimately linked to all other human endeavors and aspirations. The task is to turn science and mathematics education around, not just for the self-selected elite, but for all of our future citizens.

But AAAS has no line authority in the educational system and little direct access to students and teachers. Within its resources and capabilities, then, what could AAAS do that would make a real difference? The association answered that question by setting the following five objectives for its new science education thrust:

1. Encourage engagement. AAAS programs should provide opportunities for scientists, individually and through their organizations, to play a constructive role in the improvement of school science practices and policies.

2. Help to clarify the goals of science and mathematics education in the schools. Science in the schools ought to reflect the true nature of science itself; but it must also make sense within the practical realities of the classroom, school system, and community. AAAS should bring scientists and educators together to develop workable new goals for science education.

3. Diversify and enrich science and mathematics teaching materials. To make science and mathematics dynamic and engaging for their students, teachers need fresh, scientifically sound, and exciting materials. And teachers need convenient ways to update their own science knowledge and teaching techniques.

4. Promote the best possible science and mathematics education for all children—not just the economically and culturally advantaged. AAAS emphasizes the importance of science education not only for its traditional recipients but for all young people. Girls, minorities, inner city and rural children, the poor and disabled, and the average student and the unusually talented all deserve and need to become scientifically and mathematically literate.

5. Promote continuity of effort. All of those involved in science education, and the public too, must sustain these efforts for decades if lasting improvement is to be achieved. An articulate voice must speak

out on the issues and needs in science education, convincingly and persistently, for a long time to come.

With these goals in mind, six new programs have been established in the AAAS Office of Science and Technology Education (OSTE). Each is expected to become effective enough to warrant becoming a permanent part of the AAAS landscape, and together they constitute a cogent and sustainable AAAS program of action to contribute significantly to the improvement of science education in the nation. These are:

- Project 2061: Education for a Changing Future
- National Forum for School Science
- Coalition for Education in the Sciences
- Science Resources for Schools
- Challenge of the Unknown
- Science Seminars for Teachers

The above programs, described in the next section of this report, are enhanced by many other education projects within other parts of AAAS. Brief outlines of several of these other activities and information about AAAS complete the report.

OSTE PROGRAMS

PROJECT 2061:
EDUCATION FOR A CHANGING FUTURE

To highlight its long-range mission, Project 2061 is named for the year when Comet Halley will next return. The years until then—about a human lifespan—will surely bring changes in society even more vast than those since the comet's last visit in 1910. And science and technology will remain at the center of change—causing it, shaping it, responding to it. The AAAS is concerned with the changing future, with what might be, with what we would like all young people to have in preparation for living in a world that is bright with promise and fraught with danger. Project 2061 was created by AAAS to develop a national approach to science education geared to that future.

This project does not set out to examine, diagnose, or prescribe immediate remedies for current educational ailments—those important tasks have been addressed in dozens of earlier reports. A national conference organized by the Exxon Education Foundation was held on January 17-20, 1984, to identify the essential next steps implied by those studies. It found a basic need for "a new conceptual framework for scientific and technological education." Answering that challenge was the starting place for Project 2061.

Project 2061 is proceeding in three phases:

- *Phase I* seeks to identify appropriate learning goals to determine what young people should know about science, mathematics, and technology by the time they are 17 or 18 years old.
- *Phase II*, overlapping the first phase, will involve the educational community in translating those goals into educational specifications and guidelines.
- *Phase III* will provide strategies, leadership, and continuity in a nationwide drive to change the blueprints for action into education realities.

Phase I of Project 2061 is now under way with funding from the Carnegie Corporation of New York and the Andrew W. Mellon Foundation. It assigns to those directly involved in science the mission of determining what science, what mathematics, what technology should be selected from the myriad of possibilities as the education goals for all young people.

The project's initial work is being conducted by five specialized panels, each based in a different part of the country. Each panel, often joined by consultants and by members of other panels, meets frequently to explore ideas and argue the merits of the panelists' recommendations. From time to time pairs of panels meet to test their thinking on each other and to search for common themes.

Collectively, the panels will examine:

- The biological, agricultural, and health sciences.
- The physical, astronomical, atmospheric, earth, and engineering sciences.
- The social, behavioral, anthropological, economic, and information sciences.
- Basic and applied mathematics.
- The full range of technologies.
- The history, philosophy, values, and methodologies that distinguish these fields from each other and yet bind them together in a common enterprise.

From the work of these panels should emerge a clearer vision of what constitutes a sound, general education in science—not an encyclopedic listing of all that might be worth knowing, but a distillation of the science and technology essential to informed participation in the modern world.

The work of Project 2061 is monitored by the National Council on Science and Technology Education, an advisory board of 28 distinguished scientists and educators who will review the work of the panels periodically and guide it toward a clear and compelling conclusion.

The AAAS Board of Directors exercises the authority and responsibility for final approval and promulgation of the Project 2061 reports.

NATIONAL FORUM FOR SCHOOL SCIENCE

The National Forum for School Science emphasizes the AAAS objectives of participation and continuity in the improvement of science education.

This program, funded during design and start-up by the Carnegie Corporation of New York, involves scientists, educators, and policy makers in a lively, productive, and continuing exchange of ideas on elementary and secondary science and mathematics education. The Forum does this in several ways:

- In preparation for an annual conference, relevant data are collected and analyzed to establish a reliable common framework for discussion.
- The Forum organizes an annual conference including presentations by national leaders, as well as small group meetings involving all participants.
- A report is published after each conference to share its findings with those who could not attend and to develop a record of progress in kindergarten-through-12th- grade science education.
- Participants underwrite most of the cost of the Forum, paying a registration fee and their own travel expenses. This makes it possible to sustain the event year after year. Attendance under this arrangement also provides a practical measure of the Forum's perceived value.

The National Forum for School Science operates on a three-year cycle, examining one aspect of science education each year and then returning to it every third year.

Forum '85: Science Teaching, held in Washington, D.C., on October 10 and 11, 1985, attracted more than 300 participants. It addressed many of the problems implicated in the decline of science teaching: low salaries compared with jobs in industry, the low social status of school

teaching, insufficient resources and recognition for science teachers, lack of consensus on the goals of science teaching, inconsistent or irrelevant state certification requirements, poor enforcement of hiring regulations, misassignment of teachers, and the inability to specify what constitutes good science teaching.

The data, ideas, and recommendations emerging from this Forum are recorded in *This Year In School Science 1985: Science Teaching*, the first of the Forum's annual publications.

Forum '86 (to be held on November 14 and 15 in Washington, D.C.) focuses on the goals of school science and on science curricula and learning materials. After examining the current status of science curricula in elementary and secondary schools, Forum '86 will consider the influence of teachers, texts, and tests in determining science curricula. The role of the scientific community in helping to establish the curricula will also be discussed, paying particular attention to content recommendations generated by Project 2061.

Forum '87 will concentrate on students, the cognitive processes involved in learning science, and the influence of cultural forces and information technologies. In 1988 the Forum will begin the second cycle of this series, returning to the subject of science teachers and teaching.

COALITION FOR EDUCATION IN THE SCIENCES

One of the first steps the AAAS took in response to the growing education crisis was the formation of an informal coalition of science and science teaching organizations. Turning to its affiliated societies—especially science and science teaching associations and state science academies—AAAS solicited the participation of those with the strongest interest in cooperating to improve science and mathematics education in elementary and secondary schools. About 80 organizations responded and continue to take part in the Coalition for Education in the Sciences.

The Coalition is chiefly concerned with promoting participation and continuity of effort. It provides a way for professional associations to learn of opportunities to contribute to the improvement of science education and to share their experiences in the effective conduct of educational outreach programs.

The AAAS serves as the Coalition's secretariat and communications center. It provides administrative support, promotes broad and active participation, and produces two publications of growing importance to the enterprise: *Science Education News* and *The Science Education Directory*.

Science Education News (SE News) dates back to the post-Sputnik campaign for education reform. Soon after the Coalition was formed in 1981, *SE News* was converted from a general science education newsletter into the main communication channel of the Coalition. It now carries up-to-date news of the education activities of member organizations and summaries of relevant conferences, reports, and policy developments. It is issued ten times a year and is free of charge to all Coalition member organizations. It has drawn increasing requests from

others, however, and its mailing list now numbers about 3,000 and continues to increase.

Several improvements to *SE News* are planned. Special inserts will be included occasionally, each featuring a specific project or program of one organization. This will allow *SE News* to cover key activities in some depth without sacrificing the breadth of its general coverage. At present the content of *SE News* is a digest of news and reports published in many sources. Current plans call for seeking from member societies, federal agencies, congressional committees, and other sources useful information that might not otherwise gain attention quickly, or at all.

The annual *Science Education Directory* lists the names, titles, office addresses, and telephone numbers of the individuals responsible for activities in science, mathematics, and technology education in AAAS affiliated societies and state academies of science. Future editions will be expanded to include:

- Individuals with key science education responsibilities in a wide range of additional organizations: federal agencies, state departments of education, federal and state legislatures, foundations, science centers, national laboratories, education associations, regional education labs and centers, universities, news media, textbook publishers, and public broadcasting.
- Profiles of science education activities conducted by member societies.
- Dates and places of major events scheduled during the coming year that are of special significance to science education, including annual meetings, special conferences, and deadlines for submission of proposals.

AAAS intends to make the *Science Education Directory* the nation's most complete, accurate, and accessible source of information on the people, organizations, and events in science education and to extend its audience beyond the Coalition to include individual scientists, educators, journalists, and policy makers. A study is under way to assess the feasibility and utility of making the *Science Education Directory* accessible via an electronic database, as well as through the annual printed document.

SCIENCE RESOURCES FOR SCHOOLS

Science Resources for Schools (SRS) provides teachers with materials, methods, and support networks that encourage and enable them to give students in the middle grades active, hands-on experiences with natural phenomena. It aims to foster in all students enthusiasm for science and confidence in their ability to learn science.

The program, funded by Standard Oil Company (Ohio), is being introduced and developed in selected pilot states. These include Ohio, Colorado, North Carolina, Oregon, and Florida. The design of SRS incorporates the collaborative development of (1) activity-based science packets for classroom teachers, (2) an *SRS Leader's Guide* for statewide networks of inservice workshops that encourage a spirit of cooperative learning among teachers within a school setting, and (3) a series of *State Guidebooks* for arranging a program of professional development for science teachers in the middle grades.

Prototype packets help teachers to engage students with the ideas and reasoning of science through investigation of natural phenomena. Examples of packets are *Popping Corn; Geometry in Nature: Bubbles; Motion in Space: Comet Halley; Papermaking; Structure;* and *Fluid Patterns.*

The AAAS prepares SRS packets in collaboration with science museums and scientific societies, such as the Exploratorium (San Francisco), the Children's Museum (Boston), The Franklin Institute Science Museum (Philadelphia), the National Air and Space Museum, the American Chemical Society, and the Association of American Geographers (all in Washington, D.C.).

SRS packets include these elements:

- *Doing Science.* Single sheets of science activities that employ inexpensive, readily available materials.
- *Ideas in Science.* Illustrated booklets that provide teachers with the substantive knowledge they need to lead students through authentic science activities and to discuss their scientific significance.
- *Notes for Teaching.* A practical overview of activity-based science instruction that is tailored to the specific activities in the packet.
- *Posters.* Wall posters that illustrate the content of the *Doing Science* activities and stimulate student interest and curiosity.
- *Opportunities in Science.* Mini-poster enlargements of selected covers of *Science* magazine, showing the variety of science applications in the world today. Each mini-poster is accompanied by a leaflet describing the scientific preparation necessary for the kind of work it depicts. This section also describes what people do in different science-related occupations, including portrayals of female, minority, and physically disabled scientists.

As a teaching resource, SRS packets have three features that set them apart: 1) They provide teachers in the middle grades with fresh material year in and year out that can enliven teaching and learning and that also contribute to the teachers' continuing professional development. 2) They provide a growing, cumulative source of successful activity-based materials. 3) The process by which the SRS packets are designed and disseminated provides a productive link between middle school teachers of science and the scientific community.

Key elements in the dissemination of SRS are the workshops and *State Guidebooks.*

SRS packets are distributed to teachers in pilot states through statewide networks of inservice workshops. In collaboration with several school communities, SRS has prepared a prototype *Leader's Guide for SRS Workshops.* The *Leader's Guide* provides an orientation to activity-based science learning and models effective teaching behaviors in the use of SRS packets. Its format offers a choice of three options: a one-hour presentation, a two-and-a-half-hour session, or a full six-hour workshop.

SRS is developing and testing *State Guidebooks* in cooperation with networks of SRS users in pilot states. These guidebooks will outline state-specific plans to establish, institutionalize, and maintain programs of professional development for science teachers in the middle grades, based on the *Leader's Guide for SRS Workshops.*

CHALLENGE OF THE UNKNOWN

Challenge of the Unknown uses the visual power of film to engage students, especially in the crucial middle grades, in applied mathematical problem solving—an area of teaching that has previously had few film media resources available.

The National Council of Teachers of Mathematics and the mathematics community in general have cited mathematical problem solving as a national educational priority. The AAAS initiated Challenge of the Unknown, funded by the Phillips Petroleum Company, to develop appropriate teaching materials.

The program resulted in a set of seven 20-minute films (produced by filmmaker J. C. Crimmins with supervision by an advisory board of distinguished mathematicians, mathematics teachers, and mathematics educators appointed by the AAAS), a teaching guide, and several computer programs.

More than 500 story ideas were collected as candidates for the films; about 200 of them were researched and 32 of the ideas were developed and filmed. After final editing, 22 documentary episodes and seven comedy sequences were used. Their subjects range from canoe building to the building of St. John the Divine Cathedral in New York City; from the running speed of a dinosaur to the census in China; from speed skiing to designing a giant Ukrainian Easter egg.

To fulfill the classroom needs of mathematics teachers, these films:

- Focus on ways of using mathematical tools for solving problems, instead of just identifying the "right" answer.
- Provide many examples of nonmathematicians trying to solve interesting problems, including their confusions and false starts.

• Stress the open-ended nature of real-world problems, the need to seek solutions that are "good enough," and approaches for judging just how good a solution appears to be.

A teaching guide was created to accompany the films, elaborating the problem solving and mathematical ideas that they illustrate. The films emphasize the contextual side of problem solving; the guide highlights the operational side, explaining and expanding upon the mathematics in the films.

The *Challenge Teaching Guide* contains hundreds of problems and activities keyed to various math topics and grade levels. Some relate directly to the film episodes; some go beyond them. In addition, it contains full descriptions of the film topics, background materials, and suggested ways of using the films to give students confidence in their own ability to solve problems by using mathematics.

A set of Challenge of the Unknown videotapes is now available, free of charge, to every school that requests it, and the videotapes may be copied as desired. A free copy of the *Challenge Teaching Guide* is also available to every school; additional copies are provided at cost.

To realize the full potential of these new materials, Challenge of the Unknown is helping teachers to understand their purpose and to learn to use them effectively. AAAS is working with top mathematics educators to design model workshops for inservice training in the schools, in summer institutes at colleges and universities, and in the preservice training of future teachers of early- and middle-grade mathematics.

AAAS will continue to encourage the distribution and effective use of Challenge of the Unknown and to observe carefully and critically its classroom use. These observations should help others to create even more effective teaching materials.

SCIENCE SEMINARS FOR TEACHERS

Science Seminars for Teachers brings an outstanding selection of speakers from the AAAS Annual Meeting back to the meeting locale later for a series of seminars presented free of charge to science and mathematics teachers who could not afford the time or cost of attending the annual meeting.

In principle the AAAS Annual Meeting should be a valuable resource for science and mathematics teachers, presenting many topics in ways that would be of great benefit to them. Presentations range across the basic and applied sciences. They are usually interdisciplinary and emphasize the societal aspects of science, and many are clear and interesting even to nonspecialists. As a practical matter, however, few secondary school teachers are able to attend even when the meeting is held nearby.

AAAS recognized the need to make the valuable resources of its annual meeting more accessible to these teachers. With support from several foundations and industry groups, it planned Science Seminars for Teachers, tested its feasibility, and has continued to develop the program.

From the large array of speakers and topics at the AAAS Annual Meeting, Science Seminars staff make an initial selection. Then representatives of teachers from the community where the meeting was held, a host institution, and the AAAS staff make final selections for the seminars, decide on a format for the series, and establish a timetable. The seminars are evaluated by the junior and senior high school teachers who attend.

The first Science Seminars for Teachers series was presented after the 1984 AAAS meeting in New York City, with the cooperation of the New York Academy of Sciences. The academy contributed its conference facilities, assigned staff to the project, and assembled a planning committee of teachers. The result was a series of eight seminars, open to all

New York science teachers at no cost to them. The inaugural series topics and speakers were as follows:

- *Introduction to the Rain Forest*—Ghillean T. Prance, New York Botanical Garden, New York City.
- *Chaos: Solving the Unsolvable; Predicting the Unpredictable*—Joseph Ford, Georgia Institute of Technology, Atlanta.
- *How Stars are Born*—Bruce G. Elmegreen, IBM T. J. Watson Research Center, Yorktown Heights, New York.
- *Modern Marine Biology and Genetic Engineering*—Rita R. Colwell, University of Maryland, College Park.
- *The Carbon Dioxide Problem*—George M. Woodwell, Woods Hole Marine Biological Laboratory, Woods Hole, Massachusetts.
- *Stress and Health*—Neal E. Miller, Laboratory of Physiological Psychology, Rockefeller University, New York City.
- *Science and Abstract Art*—Henry A. Bent, North Carolina State University, Durham.
- *Touring the Fourth Dimension*—Thomas Banchoff, Brown University, Providence, Rhode Island.

This trial run of AAAS Science Seminars for Teachers was oversubscribed within a few days after it was announced by the New York Academy, and every session was rated as outstanding by those who attended.

The program is being further developed, extended, and systematized through the planning of seminars drawn from the 1985 AAAS Annual Meeting in Los Angeles, the 1986 meeting in Philadelphia, and the 1987 meeting in Chicago.

The selection system is evolving with the creation of a committee of teachers who are appointed before each meeting in cooperation with the local science teachers' association and city school authorities. Under this plan teachers attend candidate symposia at the meeting. These reviewers rate the topics for relevance and interest to teachers, and the speakers for ability to communicate to teachers. Their comments help the selection committee to prepare its final invitation list for the seminar series. This approach should greatly increase the direct involvement of science teachers in the AAAS Annual Meeting itself.

To extend the impact of the AAAS Annual Meetings even more widely, plans are being developed to make the best of the Science Seminars available to teachers outside the cities that host the meetings.

Within a few years AAAS will have identified a substantial and growing pool of tested seminar topics and presenters. It can then serve as a Science Seminars for Teachers clearinghouse for host organizations (state academies of science, science museums, libraries, and others) nationwide.

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OTHER AAAS INITIATIVES

OFFICE OF OPPORTUNITIES IN SCIENCE

The Office of Opportunities in Science works to enhance the status and accelerate the advancement of women, minorities, and physically disabled persons in all the scientific, engineering, and related professions and to ensure that educational and professional opportunities are open to these groups at all levels. To accomplish these goals, the Office of Opportunities is involved in a variety of activities.

The Linkages Project puts community-based advocacy and service organizations, such as the National Urban League, Girls Clubs of America, and A. G. Bell Association for the Deaf, in touch with scientists and engineers for joint efforts to improve the science and mathematics education of female, minority, and disabled young people. Linkages makes leaders of these organizations more aware of the growing importance of science and mathematics education for all young people. It informs them about effective educational activities within their means. And it provides technical assistance to those who establish science programs for children or science-awareness programs for parents.

The AAAS Women in Science Project addresses issues of the employment of women in science and engineering, and it seeks to increase the number of girls and young women choosing technical careers. Among recent activities, it has conducted a survey of educational, career-related programs in science, mathematics, and engineering for girls and women. And it has planned a national meeting of 300 participants as an adjunct to the 1987 International Girls and Science and Technology Forum in Ann Arbor, Michigan, to discuss the status of science careers for American women.

The Minorities in Science Program has established two networks of minority scientists to promote better science education for young peo-

ple. One involves more than 300 minority members in the *m*athematics, *e*ngineering, *s*cience and *h*ealth professions in MESHwork, an information clearinghouse and communications network. The other, Minority Women in Science (MWIS), sponsors activities aimed at advancing the science education and career development of minority females, for example, by arranging parent conferences in which minority women scientists discuss science career opportunities for minority girls.

AAAS serves as a national center for the concerns of physically disabled persons in science and for improving science education and career information for disabled young people. Among its educational activities is the Project on Science, Technology, and Disability. This project has listed more than 1,200 disabled scientists and engineers available for consultation on career choices. It has also developed ways to encourage disabled students to participate in out-of-school science programs.

OFFICE OF COMMUNICATIONS

In cooperation with other AAAS departments, the Office of Communications provides liaison with both commercial and public media. It provides two science radio programs of interest to students, teachers, and the general public.

"Report on Science" is a daily 90-second radio science news feature, broadcast by the CBS Radio Stations News Service. Its topics, often based on articles from *Science* and other journals and scientific meetings, range from animal behavior to cosmology and are appropriate for schoolchildren as well as adults.

"Focus," a series of 30-minute public affairs programs dealing with science and technology topics of public interest, is distributed on cassettes to some 220 noncommercial and college radio stations and is sent to all National Public Radio stations via the NPR satellite.

OFFICE OF PUBLIC SECTOR PROGRAMS

The Office of Public Sector Programs conducts a range of activities to help improve public policymaking related to science and technology and enhance the public understanding of science.

The Science and Technology Centers Project involves AAAS members in the activities of their local science museums. AAAS volunteers advise students at the museums; teach special classes for children, young people, and teachers; and work with school systems to prepare information for class visits to museums. Occasionally the project sponsors special education events at participating museums.

MEETINGS AND PUBLICATIONS CENTER

The Meetings and Publications Center administers the AAAS Annual Meeting, coordinates the planning for symposia and colloquia, and manages the publication of AAAS- sponsored books and special reports.

Science Encounters is a program for high school students conducted each year at the AAAS Annual Meeting and includes a youth symposium, conversations with scientists, and student research papers. Regular events, such as the Science Film Festival and the Public Lectures, are also open to students, and efforts are being made to increase their attendance. A special effort is made to reach girls, minority members, the disabled, and other young people who may hesitate to consider careers in science.

Science Books & Films, a review journal published five times a year, is the only serial publication in the United States and Canada devoted to critical reviews of science and mathematics books, films, and videotapes at all educational levels—kindergarten through college. More than 1,500 items are reviewed each year by some 2,500 professional scientists. Special issues of particular interest to teachers and school administrators have focused recently on textbook selection, computer books and films, and science fair projects. From time to time, annotated book and film lists derived from *Science Books & Films* are published.

Books on science education are also published by AAAS. Recent titles include *Science Education in Global Perspective*, edited by Margrete Siebert Klein and F. James Rutherford, and *Low Tech Education in a High Tech World* by Elizabeth L. Useem.

ABOUT AAAS

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

The American Association for the Advancement of Science, founded in 1848, is the world's largest federation of scientific and engineering societies. It currently has some 135,000 individual members and nearly 300 affiliated societies and academies of science. In addition to weekly publication of *Science* and the holding of the AAAS Annual Meeting, AAAS engages in a variety of other activities to assist in achieving its goals, which are to advance the interests of science, scientists, and human progress. To help meet these goals, AAAS has a diversified agenda of programs bearing upon science and technology policy; public understanding of science; science education; international cooperation in science and engineering; assistance to Congress and the Executive office; and opportunities in science and engineering for women, minorities, and the disabled.

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AAAS SECTIONS

The AAAS is organized in 22 sections corresponding to the fields of interest of its members. Members of the association may enroll in the sections of their choice, and the affairs of each section are managed by a section committee consisting of elected officers and appointed representatives of affiliated organizations. Under the direction of the section secretary, the section committee promotes the work of the association in its own field and arranges programs for presentation at AAAS meetings.

AAAS members channel much of their participation in association affairs through these sections. One of them, Section Q, was started by John Dewey to bring together scientists and citizens interested in education issues and is playing a major role in formulating the AAAS program of action. But other sections, especially those devoted to mathematics, physics, chemistry, the biological sciences, and engineering, are also concerned with education in their fields. The sections of the association are:

A. Mathematics

B. Physics

C. Chemistry

D. Astronomy

E. Geology and Geography

G. Biological Sciences

H. Anthropology

J. Psychology

K. Social, Economic, and Political Sciences

L. History and Philosophy of Science

M. Engineering

N. Medical Sciences

O. Agriculture

P. Industrial Science

Q. Education

R. Dentistry

S. Pharmaceutical Sciences

T. Information, Computing, and Communication

U. Statistics

W. Atmospheric and Hydrospheric Sciences

X. Societal Impacts of Science and Engineering

Y. General Interest in Science and Engineering

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